

XV. *On the manner in which the ravages of the larvæ of a Nematus, on Salix cinerea, are checked by Picromerus bidens, L. By ALBERT MÜLLER, F.L.S.*

[Read 2nd December, 1872.]

ON the 30th September last I happened to saunter over the summit of Shirley Heath, when my attention was attracted by an isolated bush of *Salix cinerea* growing in a slight hollow of the heath. Already from a distance I could perceive that something unusual had taken place, as all the top shoots were entirely deprived of their foliage. A closer examination revealed the following state of things. Hundreds of saw-fly larvæ in different stages of growth were feeding on the middle and lower branches. The top branches had entirely been cleared by them of every leaf, the bare branches retaining only the mid-ribs and a few shreds of the stronger lateral ribs. Each leaf, or more correctly the series of leaves of each twig, were occupied by individuals of the same size; thus separate twigs exhibited distinct broods, of which (to judge by size only) I counted four of different ages.

While feeding, the individuals of all these broods clung to the edges of the leaves by means of their three pairs of pectoral feet, the body resting curled up mostly on the under side of the leaves, but directly a twig was shaken the hind-bodies were violently thrown upwards, and then generally remained in that position for some time, until the branch was again disturbed, when a whipping to and fro of most of the upturned hind-bodies would follow. I could not perceive the emission of any odour or secretion so long as the larvæ were not actually handled, but if taken up by the fingers a foetid smell became at once perceptible. The following description is taken from a full-fed larva, captured on the ground below the bush:—

Length, 2 centimètres; width,  $2\frac{1}{2}$  millimètres; width of the head, 2 millimètres; 20 feet (6 pectoral, 12 ventral, 2 anal); between the 3rd pectoral pair and the 1st true ventral pair, a slight conical protuberance on each side seems to represent an abortive pair of ventral legs; the 11th ventral segment is footless. Head shining black;

buccal organs piceous, body greenish-yellow, dorsal region with three black longitudinal and parallel stripes; segment next to the head without any mark or spot whatever; above the ventral feet a row of black more or less oval raised spots. Pectoral legs spotted very slightly, each with a blackish horny shield sideways exteriorly; between each pair of ventral feet a yellowish wart-like protuberance. In one set of younger (?) larvæ on the bush, the central dorsal stripe was entirely absent.

I have in vain endeavoured to identify these larvæ with those described by Brischke, Zaddach and Thomson. My larvæ are evidently the same as those figured by Réaumur, (*Mémoires*, T. V., pl. 11, figs. 3, 4), and the same as those described by Hartig (*Blattwespen*, etc., p. 218) as belonging to his *Nematus ochraceus*.

Several of them have since (4th October, 1872) spun their oval cocoons of a pale-yellowish silk at the bottom of a glass vessel in which I had confined them, so I hope to report their correct name on a future occasion.

While I kept watching the bush in question, I noticed a number of a species of *Hemiptera*—*Picromerus bidens*, L.—occupied with sucking the juices of these saw-fly larvæ; and to judge by the great number of dead half-shriveled larvæ lying underneath the bush, this wholesale slaughter must have been going on for some days. Specimens of this bug came at irregular intervals crawling up the various branches leading to the twigs where their victims were feeding. One of these *Hemiptera*, which I kept watching at convenient times on my return home, where I supplied it with some branches full of feeding larvæ, proceeded as follows in satisfying its appetite:—

1.35 P.M. — Saw the *Picromerus* sucking one of the larvæ; sucker inserted near the middle of the underside of the body; larva struggling but held partly aloof, spitted on the rostrum. For a moment the Hemipteron held on by the fore legs only, the hind legs being cleansed by being rubbed against each other. The saw-fly larva was quite helpless within a quarter of an hour, appearing then but slightly emptied. The bug now put it down on the leaf, and pressing its fore legs against the body, withdrew its rostrum, which was then slowly and carefully cleaned by being passed between the anterior tarsi. With the cleansing of the antennæ it proceeded in a different manner. These appendages were alternately passed through a notch at the end of each anterior tibia.

1.55.—The *Picromerus* deliberately but very cautiously approaches another feeding larva, and drives its outstretched rostrum into the middle of the underside of its body; the victim tries to lash its hind body rapidly to and fro, and anchors itself firmly by means of its three pairs of pectoral legs. But the first joint of the aggressor's rostrum has entered its vitals, and is kept at right angles to the remaining joints, so that the larva appears securely hooked.

2.10.—Larva has ceased to struggle: its fore legs have lost their hold. The Hemipteron now pulled it underneath its own body, and held it longitudinally, using both fore legs as arms, and grasping the larva, which is lying on its back, on each side.

3.25.—The bug holds the same larva in the same position, and still sucks its juices.

3.33.—Parts with its victim in the same manner as before, using its fore legs to hold the larva, till the rostrum is withdrawn.

4th October, 1872: 8.20 P.M.—Found the *Picromerus* laying on its back, dead, with fully distended abdomen. From the afternoon of the 30th September last till now it had sucked no less than 36 larvæ of different sizes, that is to say, partly sucked them, as the bodies are by no means emptied. The bug seems only to enjoy its liquid food so long as it can derive the latter from the living body. Directly vital action ceases in the larva sucked, the Hemipteron leaves it. I have on several occasions seen the *Picromerus* first touch its prey with the antennæ, then outstretch its rostrum, and rapidly move the last joint of this organ up and down, a movement of anticipated enjoyment, as it appeared to me.

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